End of Result Set

Generate Collection

L43: Entry 1 of 1 File: USPT Feb 26, 1991

US-PAT-NO: 4996663
DOCUMENT-IDENTIFIER: US 4996663 A

TITLE: Methods and apparatus for decontaminating hash tables

DATE-ISSUED: February 26, 1991

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nemes; Richard M.	Brooklyn	NY	N/A	N/A

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Bell Communications Research, Inc.	Livingston	NJ	N/A	N/A	02

APPL-NO: 7/ 151638
DATE FILED: February 2, 1988

INT-CL: [5] G06F 12/00
US-CL-ISSUED: 364/900; 364/962.1, 364/963.3, 364/967.5, 364/974.5
US-CL-CURRENT: 707/200; 711/216
FIELD-OF-SEARCH: 364/2MSFile, 364/9MSFile

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected Search ALL

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	4121286	October 1978	Venton et al.	364/900 X
☐	4215402	July 1980	Mitchell et al.	364/200
☐	4447875	May 1984	Bolton et al.	364/200
☐	4502118	February 1985	Hagenmaier, Jr. et al.	364/200
☐	4716524	December 1987	Oxley et al.	364/200
☐	4775932	October 1988	Oxley et al.	364/200

OTHER PUBLICATIONS

"Data Structures with Abstract Data Types and Pascal," D. F. Stubbs and N. W. Webre, Brooks/Cole Publishing Company, 1985, Section 7-4, Hashed Implementations, pp. 310-336.
"Hints for Computer System Design," Butler W. Lampson, IEEE Software, Jan. 1984, p. 23.
"Grapevine, An Exercise in Distributed Computing," Birrell et al., Communications of the ACM, vol. 25, No. 4, Apr. 1982, pp. 260-274.
"Walnut & Storing Electronic Mail in a Database," Donahue et al., Palo Alto Research Center, Nov. 1985, pp. 1-20.
"The Art of Computer Programming", Sorting and Searching, D. E. Knuth, Addison-Wesley Series in Computer Science and Information Processing, pp. 506-549, 1973.
"Data Structures and Program Design", R. L. Kruse, Prentice-Hall, Inc., 1984, Section 3.7, Hashing, pp. 112-126.

ART-UNIT: 237

PRIMARY-EXAMINER: Shaw[illegible]areth D.
ASSISTANT-EXAMINER: Kulik; Paul
ATTY-AGENT-FIRM: Falk; James W.

ABSTRACT:

A method and apparatus for performing storage and retrieval in an information storage system is disclosed which uses the hashing technique. In order to prevent contamination of the storage medium by deleted records, a hybrid hashing technique is used which uses a fast, contaminating deletion of records during times of heavy load on the system, but uses a slow, non-contaminating deletion when the load on the system is not as heavy. The slow, non-contaminating deletion automatically removes previously generated contamination in the vicinity of the slow, non-contaminating deletion, thereby automatically decontaminating the storage space. Because no long term contamination can build up in the present system, it is useful for large data bases which are heavily used and which require the fast access provided by hashing.

6 Claims, 10 Drawing figures

End of Result Set

Generate Collection

L42: Entry 1 of 1 File: USPT Jun 9, 1992

US-PAT-NO: 5121495
DOCUMENT-IDENTIFIER: US 5121495 A

TITLE: Methods and apparatus for information storage and retrieval utilizing hashing techniques

DATE-ISSUED: June 9, 1992

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nemes; Richard M.	Brooklyn	NY	N/A	N/A

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Bell Communications Research, Inc.	Livingston	NJ	N/A	N/A	02

APPL-NO: 7/ 430901
DATE FILED: October 31, 1989

PARENT-CASE:
This application is a continuation of application Ser. No. 07/151,639, filed Feb. 2, 1988 now abandoned.

INT-CL: [5] G06F 15/411, G06F 12/00
US-CL-ISSUED: 395/600; 364/222.81, 364/222.82, 364/281.1, 364/282.1, 364/252.3, 364/DIG.1

US-CL-CURRENT: 707/3
FIELD-OF-SEARCH: 364/2MSFile, 364/9MSFile

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected Search ALL

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	4121286	October 1978	Venton et al.	364/900 X
☐	4215402	July 1980	Mitchell et al.	364/200
☐	4447875	May 1984	Bolton et al.	364/200
☐	4502118	February 1985	Hagenmaier, Jr. et al.	364/200
☐	4716524	December 1987	Oxley et al.	364/200
☐	4775932	October 1988	Oxley et al.	364/200

OTHER PUBLICATIONS

"The Art of Computer Programming", Sorting and Searching, D. E. Knuth, Addison-Wesley Series in Computer Science and Information Processing, pp. 506-549, 1973.
"Data Structures with Abstract Data Types and Pascal", D. F. Stubbs and N. W. Webre, Brooks/Cole Publishing Company, 1985, Section 7.4, Hashed Implementations, pp. 310-336.
"Data Structures and Program Design", R. L. Kruse, Prentice-Hall, Inc. 1984, Section 3.7, Hashing, pp. 112-126.

ART-UNIT: 237
PRIMARY-EXAMINER: Shaw; Gareth D.
ASSISTANT-EXAMINER: Kulik; Paul
ATTY-AGENT-FIRM: Falk; James W.

ABSTRACT:

A method and apparatus for performing storage and retrieval in an information storage system is disclosed which uses the hashing technique. In order to prevent contamination of the storage medium by automatically expiring records, a garbage collection technique is used which removes all expired records in the neighborhood of a probe into the data storge system. More particularly, each probe for insertion, retrieval or deletion of a record is an occasion to search the entire chain of records found for expired records and then removing them and closing the chain. This garbage collection automatically removes expired record contamination in the vicinity of the probe, thereby automatically decontaminating the storage space. Because no long term contamination can build up in the present system, it is useful for large data bases which are heavily used and which require the fast access provided by hashing.

8 Claims, 7 Drawing figures

Generate Collection

L35: Entry 1 of 3 File: USPT Sep 15, 1998

US-PAT-NO: 5809494
DOCUMENT-IDENTIFIER: US 5809494 A

TITLE: Method for rapidly and efficiently hashing records of large databases

DATE-ISSUED: September 15, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nguyen; John N.	Belmont	MA	N/A	N/A

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Applied Language Technologies, Inc.	Boston	MA	N/A	N/A	02

APPL-NO: 8/ 559532
DATE FILED: November 16, 1995

INT-CL: [6] G06F 17/30
US-CL-ISSUED: 707/1; 364/419.19, 364/421.06, 364/410, 364/427
US-CL-CURRENT: 707/1; 701/15, 704/201, 704/231
FIELD-OF-SEARCH: 395/600, 395/601

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected Search ALL

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	4215402	July 1980	Mitchell et al.	364/200
☐	4464713	August 1984	Benhase et al.	364/200
☐	4959785	September 1990	Yamamoto et al.	364/419
☐	4961139	October 1990	Hong et al.	364/200
☐	4996663	February 1991	Nemes	364/900
☐	5121495	June 1992	Nemes	395/600
☐	5197002	March 1993	Spencer	364/406
☐	5199073	March 1993	Scott	380/49
☐	5204958	April 1993	Cheng et al.	395/600
☐	5333313	July 1994	Heising	395/600
☐	5359720	October 1994	Tamura et al.	395/400
☐	5511190	April 1996	Sharma et al.	395/600
☐	5542087	July 1996	Neimat et al.	396/600

OTHER PUBLICATIONS

Glenn Fowler, "A Flat file database query language", Usenix, pp. 1-12, Jan. 1994.

C.J.Date "Introduction to Database Systems" Addison-Wesley Publishing Company, 6th ed. pp. 733-738, Aug. 1995.

ART-UNIT: 237
PRIMARY-EXAMINER: Black; Thomas G.
ASSISTANT-EXAMINER: Corrielus; Jean M.
ATTY-AGENT-FIRM: Cesari & McKenna, LLP

ABSTRACT:

A method for rapidly hashing records in a large database stored on a secondary storage device in which a set of memory-blocks are preferably established in main memory for receiving information. Each memory block is associated with a sub-range of hash values that collectively span a range of hash values derived from one or more fields of the database records. The hash values together with other information are distributed among the memory-blocks in accordance with the range of hash values. As each memory block fills, its contents are written to an intermediate file associated with the memory-block in secondary storage. The intermediate files are subsequently retrieved and the hash values stored therein are ordered. The ordered intermediate files are then written to secondary storage as a single hash table spanning the entire database.

9 Claims, 4 Drawing figures

Generate Collection

L28: Entry 1 of 3 File: USPT Mar 4, 1986

US-PAT-NO: 4574346
DOCUMENT-IDENTIFIER: US 4574346 A

TITLE: Method and apparatus for peripheral data handling hierarchies

DATE-ISSUED: March 4, 1986

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Hartung; Michael H.	Tucson	AZ	N/A	N/A

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
International Business Machines Corporation	Armonk	NY	N/A	N/A	02

APPL-NO: 6/ 426367
DATE FILED: September 29, 1982

INT-CL: [4] G06F 12/08, G06F 13/14
US-CL-ISSUED: 364/200
US-CL-CURRENT: 711/117; 711/112, 711/160
FIELD-OF-SEARCH: 364/2MSFile, 364/9MSFile

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected Search ALL

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	3328768	June 1967	Amdahl	364/200
☐	3890601	June 1975	Pietroiewicz	364/200
☐	3938097	February 1976	Niguette, III	364/200
☐	3967247	June 1976	Andersen et al.	364/200
☐	4080652	March 1978	Cronshaw et al.	364/200
☐	4118789	October 1978	Casto et al.	364/900
☐	4128882	December 1978	Dennis	364/200
☐	4197580	April 1980	Chang et al.	364/200
☐	4313161	January 1982	Hardin et al.	364/200
☐	4403288	September 1983	Christian et al.	364/200
☐	4429363	January 1984	Duke et al.	364/200
☐	4466059	August 1984	Bastian et al.	364/200

ART-UNIT: 237
PRIMARY-EXAMINER: Chan; Eddie P.
ATTY-AGENT-FIRM: Somermeyer; H. F.

ABSTRACT:

Data supplied to a data storage system by a host processor has one of two use status. A first use status is that the supplied data is to be retentively stored in the data storage system. A second use status is that the supplied data is exempted from the retentive storage requirement. An example of exempted use status is that data only temporarily stored in the data storage system, i.e. is transitory. A second example is data that is being manipulated prior to retentive storage, data that is temporarily volatile. Termination of the exempted use status results in either discard or a retentive storage of the exempted use data. Data integrity controls for the exempted use status data are described. The invention is described for a data storage hierarchy environment having a volatile cache and a magnetic recorder as a backing store. The exempted use data need be stored only in or primarily in the cache while retentive data is primarily stored in the retentive store and selectively in the cache.

64 Claims, 8 Drawing figures

Generate Collection

L34: Entry 1 of 3 File: USPT Feb 10, 1998

US-PAT-NO: 5717893
DOCUMENT-IDENTIFIER: US 5717893 A

TITLE: Method for managing a cache hierarchy having a least recently used (LRU) global cache and a plurality of LRU destaging local caches containing counterpart datatype partitions

DATE-ISSUED: February 10, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Mattson; Richard Lewis	San Jose	CA	N/A	N/A

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
International Business Machines Corporation	Armonk	NY	N/A	N/A	02

APPL-NO: 7/ 703309
DATE FILED: May 20, 1991

PARENT-CASE:
This application is a continuation-in-part of application Ser. No. 07/327,204, filed Mar. 22, 1989, now abandoned.

INT-CL: [6] G06F 12/12, G06F 13/00
US-CL-ISSUED: 395/456; 395/480, 395/463
US-CL-CURRENT: 711/129
FIELD-OF-SEARCH: 395/425, 395/600, 395/456, 395/446, 395/447, 395/457, 395/497.04, 395/463, 395/487, 395/449, 395/621, 395/480

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected Search ALL

	PAT-NO	ISSUE[illegible]TE	PATENTEE-NAME	US-CL
☐	4371929	February 1983	Brann et al.	395/865
☐	4430712	February 1984	Coulson et al.	395/621
☐	4442487	April 1984	Fletcher et al.	395/449
☐	4458310	July 1984	Chang	395/446
☐	4463424	July 1984	Mattson et al.	395/463
☐	4476526	October 1984	Dodd	395/440
☐	4503501	March 1985	Coulson et al.	395/456
☐	4636946	January 1987	Hartung et al.	395/463
☐	4754394	June 1988	Brantley, Jr. et al.	395/405
☐	4755930	July 1988	Wilson, Jr. et al.	395/449
☐	4797814	January 1989	Brenza	395/403
☐	4835686	May 1989	Furuya et al.	395/463
☐	4905141	February 1990	Brenza	395/456
☐	4920478	April 1990	Furuya et al.	395/463
☐	5043885	August 1991	Robinson	395/460
☐	5117350	May 1992	Parrish et al.	395/401

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	US-CL
203601	March 1986	EPX	
8301323	April 1983	WOX	
8402013	May 1984	WOX	

OTHER PUBLICATIONS

"Vertical Partitioning in Cache Hierarchies," IBM Technical Disclosure Bulletin vol. 30, No. 8, Jan. 1988, p. 33.

ART-UNIT: 232
PRIMARY-EXAMINER: Gossage; Glenn
ATTY-AGENT-FIRM: Brodie; R. Bruce Klein; Ester E.

ABSTRACT:

A method for managing a cache hierarchy having a fixed total storage capacity is disclosed. The cache hierarchy is logically partitioned to form a least recently used (LRU) global cache and a plurality of LRU destaging local caches. The global cache stores objects of all types and maintains them in LRU order. In contrast, each local cache is bound to objects having a unique data type T(i), where i is indicative of a DataType. Read and write accesses by referencing processors or central processing units (CPU's) are made to the global cache. Data not available in the global cache is staged thereto either from one of the local caches or from external storage. When a cache full condition is reached, placement of the most recently used (MRU) data element to the top of the global cache results in an LRU data element of type T(i) being destaged from the global cache to a corresponding one of the local caches storing type T(i) data. Likewise, when a cache full condition is reached in any one or more of the local caches, the local caches in turn will destage their LRU data elements to external storage. The parameters defining the partitions are externally supplied.

1 Claims, 28 Drawing figures

Generate Collection

L33: Entry 1 of 3 File: USPT Jan 6, 1998

US-PAT-NO: 5706506
DOCUMENT-IDENTIFIER: US 5706506 A

TITLE: Method and apparatus for managing relational data in an object cache

DATE-ISSUED: January 6, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Jensen; Richard H.	Redwood City	CA	N/A	N/A
Henninger; Derek P.	Cupertino	CA	N/A	N/A

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Persistence Software, Inc.	San Mateo	CA	N/A	N/A	02

APPL-NO: 8/ 729262
DATE FILED: October 10, 1996

PARENT-CASE:
This is a continuation of Ser. No. 08/409,480, filed Mar. 22, 1995, now U.S. Pat. No. 5,615,362, which is a continuation of Ser. No. 08/101,385, filed Aug. 2, 1993, now abandoned.

INT-CL: [6] G06F 17/30
US-CL-ISSUED: 395/614; 395/445
US-CL-CURRENT: 707/103; 711/118
FIELD-OF-SEARCH: 364/DIG.1, 364/DIG.2, 395/425, 395/445, 395/600, 395/614

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected Search ALL

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	4930071	May 1990	Tou et al.	364/300
☐	4947320	August 1990	Crus et al.	395/600
☐	5212787	May 1993	Baker et al.	395/600
☐	5220657	June 1993	Bly et al.	395/425
☐	5235701	August 1993	Ohler et al.	395/600
☐	5261069	November 1993	Wilkinson et al.	395/425
☐	5263167	November 1993	Conner, Jr. et al.	395/700
☐	5295256	March 1994	Bapat	395/500
☐	5297279	March 1994	Bannon et al.	395/600
☐	5305389	April 1994	Palmer	382/1
☐	5313629	May 1994	Abraham et al.	395/600
☐	5315709	May 1994	Alston, Jr. et al.	395/600
☐	5317742	May 1994	Bapat	395/700
☐	5341478	August 1994	Travis, Jr. et al.	395/200
☐	5347477	September 1994	Lee	364/709.11
☐	5386527	January 1995	Bosshart	395/403
☐	5414827	May 1995	Lin	395/462
☐	5423019	June 1995	Lin	395/462
☐	5434990	July 1995	Moussavi et al.	395/425
☐	5615362	March 1997	Jensen et al.	395/614

OTHER PUBLICATIONS

Stonebraker, M. et al., "The POSTGRES next-generation database management system", Comm of the ACM, vol. 34, No. 10, Oct. 1991, pp. 78-93.
Stone, C.M. et al., "Database Wars Revisited: How do you decide which type of database is best when even the experts can't agree?", BYTE, vol. 15, No. 10, Oct. 1990, p. 233.

ART-UNIT: 237
PRIMARY-EXAMINER: Black; Thomas G.
ASSISTANT-EXAMINER: Von Buhr; Maria N.
ATTY-AGENT-FIRM: Allen; Kenneth R. Townsend and Townsend and Crew LLP

ABSTRACT:

In an object-oriented application being executed in a digital computing system comprising a processor, a method and apparatus are provided for managing information retrieved from a structured database, such as a relational database, wherein the processor is used to construct a plurality of object instances, each of these object instances having its own unique object ID that provides a mapping between the object instance and at least one row in the structured database. The processor is used to construct a single cohesive data structure, called an object cache, that comprises all the object instances and that represents information retrieved from the structured database in a form suitable for use by one or more object-oriented applications. A mechanism for managing the object cache is provided that has these three properties: First, through a technique called key swizzling, it uses explicit relationship pointers between object instances in the object cache to reduce the volume of queries to the structured database. Second, it ensures that only one copy of an object instance is in the cache at any given time, even if several different queries return the same information from the database. Third, the mechanism guarantees the integrity of data in the cache by locking data appropriately in the structured database during a database transaction, flushing cache data at the end of each transaction, and transparently re-reading the data and reacquiring the appropriate locks for an object instance whose data has been flushed.

14 Claims, 10 Drawing figures

L32: Entry 1 of 3 File: USPT Feb 20, 1996

US-PAT-NO: 5493668
DOCUMENT-IDENTIFIER: US 5493668 A

TITLE: Multiple processor system having software for selecting shared cache entries of an associated castout class for transfer to a DASD with one I/O operation

DATE-ISSUED: February 20, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Elko; David A.	Poughkeepsie	NY	N/A	N/A
Frey; Jeffrey A.	Fishkill	NY	N/A	N/A
Mohan; Chandrasekaran	San Jose	CA	N/A	N/A
Narang; Inderpal S.	Saratoga	CA	N/A	N/A
Nick; Jeffrey M.	Fishkill	NY	N/A	N/A
Strickland; Jimmy P.	Saratoga	CA	N/A	N/A
Swanson; Michael D.	Poughkeepsie	NY	N/A	N/A

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
International Business Machines Corporation	Armonk	NY	N/A	N/A	02

APPL-NO: 7/ 860806
DATE FILED: March 30, 1992

PARENT-CASE:
This application claims the priority date of Dec. 14, 1990, for the matter disclosed in a prior U.S. application Ser. No. 07/629,315, filed Dec. 14, 1990, by C. Mohan et al and entitled "Non-blocking Serialization for Removing Data From A Cache" which is a pending unissued application at the time of filing of this application. The contents of prior application Ser. No. 07/629,315, abandoned, is carried into this application which is a continuation-in-part of prior application Ser. No. 07/629,315, abandoned; and both applications have at least one invention in common.

INT-CL: [6] G06F 12/02, G06F 13/00
US-CL-ISSUED: 395/457; 395/440, 395/200.08, 364/228.1, 364/243.41, 364/246.3, 364/243.7
US-CL-CURRENT: 711/130; 711/113
FIELD-OF-SEARCH: 395/425, 395/275, 395/250, 395/200, 364/200

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

	PAT-NO	ISSUE DATE	PATENTEE-NAME	US-CL
☐	4317168	February 1982	Messina et al.	395/250
☐	4441155	April 1984	Fletcher et al.	364/200
☐	4445174	April 1984	Fletcher	364/200
☐	4603382	July 1986	Cole et al.	395/250
☐	4636946	January 1987	Hartung et al.	364/200
☐	5113514	May 1992	Albonesi et al.	395/425
☐	5142627	August 1992	Elliot et al.	395/275
☐	5163148	November 1992	Walls	395/600
☐	5386546	January 1995	Hamaguchi	395/425

ART-UNIT: 237
PRIMARY-EXAMINER: Lee; Thomas C.
ASSISTANT-EXAMINER: Weinstein; Marc K.
ATTY-AGENT-FIRM: Goldman; Bernard M.

ABSTRACT:

A high-speed cache is shared by a plurality of independently-operating data systems in a multi-system data sharing complex. Each data system has access both to the high-speed cache and the lower-speed, secondary storage for obtaining and storing data. Management logic and the high-speed cache assures that a block of data obtained form the cache for entry into the secondary storage will be consistent with the version of the block of data in the shared cache with non-blocking serialization allowing access to a changed version in the cache while castout is being performed. Castout classes are provided to facilitate efficient movement from the shared cache to DASD.

35 Claims, 27 Drawing figures

Generate Collection

L30: Entry 1 of 3 File: USPT Aug 10, 1993

US-PAT-NO: 5235701
DOCUMENT-IDENTIFIER: US 5235701 A

TITLE: Method of generating and accessing a database independent of its structure and syntax

DATE-ISSUED: August 10, 1993

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Ohler; Peter C.	Lafayette	CA	N/A	N/A
Gu; Xin	Albany	CA	N/A	N/A

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Teknekron Communications Systems, Inc.	Berkeley	CA	N/A	N/A	02

APPL-NO: 7/ 574587
DATE FILED: August 28, 1990

INT-CL: [5] G06F 15/40
US-CL-ISSUED: 395/600; 395/425, 364/DIG.1, 364/282.1, 364/283.4, 364/280, 364/280.4
US-CL-CURRENT: 707/1
FIELD-OF-SEARCH: 395/600, 395/700, 395/425

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected Search ALL

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	4774661	September 1988	Kumpati	395/600
☐	4930071	May 1990	Tou et al.	395/600

OTHER PUBLICATIONS

Fishman, D. H., et al., "Iris: An Object-Oriented Database Management System", ACM Transactions on Office Information Systems, vol. 5, No. 1, Jan. 1987, pp. 48-69.
Duff, Charles B., "Designing an Efficient Language," Byte, Aug. 1986, pp. 211-224.
Declaration of Peter C. Ohler, filed Jun. 24, 1991 and the Agreement attached thereto.

ART-UNIT: 237
PRIMARY-EXAMINER: Kulik; Paul V.
ATTY-AGENT-FIRM: Limbach & Limbach

ABSTRACT:

A method of generating and accessing a database table having data stored in a unique structure and syntax is disclosed. A database access library having an access function is created. The access function of the database access library is mapped to the database table. A data object is also created. The data object has a plurality of data attributes. Each data attribute of the data object is mapped to the database table using the access function. Accessing of the data object is independent of the structure and syntax of the database table.

3 Claims, 2 Drawing figures

3 Claims, 2 Drawing figures

Generate Collection

L27: Entry 1 of 5 File: USPT Dec 20, 1983

US-PAT-NO: 4422145
DOCUMENT-IDENTIFIER: US 4422145 A

TITLE: Thrashing reduction in demand accessing of a data base through an LRU paging buffer pool

DATE-ISSUED: December 20, 1983

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Sacco; Giovanni M.	Turin	N/A	N/A	ITX
Schkolnick; Mario	Monte Sereno	CA	N/A	N/A

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
International Business Machines Corporation	Armonk	NY	N/A	N/A	02

APPL-NO: 6/ 334272
DATE FILED: October 26, 1981

PCT-DATA:

APPL-NO	DATE-FILED	PUB-NO	PUB-DATE	371-DATE	102(E)-DATE
PCT/US81/01109	August 18, 1981	WO83/00758	Mar 3, 1983	Oct 26, 1981	Oct 26, 1981

INT-CL: [3] G11C 9/06
US-CL-ISSUED: 364/300; 364/200
US-CL-CURRENT: 711/160
FIELD-OF-SEARCH: 364/200, 364/300, 364/900

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected Search ALL

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	235806	February 1981	Mattson et al.	N/A
☐	3806883	April 1974	Weisbecker	364/200
☐	3958228	May 1976	Coombes et al.	364/200
☐	4035778	July 1977	Ghanem	364/200
☐	4059850	November 1977	Van Eck et al.	364/200
☐	4168541	September 1979	De Karske	364/200

OTHER PUBLICATIONS

Lang, et al., "Data Base Buffer Paging in Virtual Storage Systems", ACM Transactions on Data Base Systems, Dec. 1977, pp. 339-351.
Selinger, et al., "Access Path Selection in a Relational Data Base", Proc. 1979, Sigmod Conf. of ACM, pp. 22-34.
IBM General Information and Concepts and Installation Manuals, GH24-5012 and GH24-5013, Jan. 1981.
Denning, "The Working Set Model for Programmed Behavior", Communication of ACM, vol. 11,

May 1968, pp. 323-333.
Shaw, "The Logical Design of Operating Systems", 1974, pp. 138-144.
Coffman, "Operating Systems Theory", Prentice-Hall, pp. 298-299, 1973.

ART-UNIT: 232
PRIMARY-EXAMINER: Zache; Raulfe B.
ATTY-AGENT-FIRM: Brodie; R. Bruce

ABSTRACT:

A CPU implementable method for minimizing thrashing among concurrent processes demand page accessing a data base through an LRU page organized buffer pool. There is ascertained the set of pages over which there is looping access behavior for the prospectively executing concurrent processes. This parameter, as determined for each task, is passed to the storage accessing component which partitions the buffer into LRU stacks and dynamically adjusts the stack to this predicted parameter size.

9 Claims, 4 Drawing figures

Generate Collection

L2: Entry 4 of 14 File: USPT Sep 28, 1999

US-PAT-NO: 5960434
DOCUMENT-IDENTIFIER: US 5960434 A

TITLE: System method and computer program product for dynamically sizing hash tables

DATE-ISSUED: September 28, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Schimmel; Curt F.	San Ramon	CA	N/A	N/A

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Silicon Graphics, Inc.	Mountain View	CA	N/A	N/A	02

APPL-NO: 8/ 938672
DATE FILED: September 26, 1997

INT-CL: [6] G06F 17/30
US-CL-ISSUED: 707/100; 707/101, 707/102, 707/103
US-CL-CURRENT: 707/100; 707/101, 707/102
FIELD-OF-SEARCH: 707/100, 707/101, 707/102, 707/103

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected Search ALL

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	4996663	February 1991	Nemes	364/900
☐	5121495	June 1992	Nemes	707/100
☐	5197002	March 1993	Spencer	364/406
☐	5265245	November 1993	Nordstrom et al.	707/101
☐	5287499	February 1994	Nemes	707/100
☐	5511190	April 1996	Sharma et al.	707/102
☐	5612865	March 1997	Dasgupta	364/184
☐	5623545	April 1997	Childs et al.	380/2
☐	5706462	January 1998	Matousek	395/445

OTHER PUBLICATIONS

Keller, Fast Rehashing in PRAM Emulations, IEEE, pp. 626-631, Dec. 1993.
Chung et al, Dynamic Signature Hashing, IEEE, pp. 257-262, Sep. 1989.

ART-UNIT: 271
PRIMARY-EXAMINER: Black; Thomas G.
ASSISTANT-EXAMINER: Coby; Frantz
ATTY-AGENT-FIRM: Sterne, Kessler, Goldstein & Fox, P.L.L.C.

ABSTRACT:

The present invention is a system, method, and computer program product for dynamically sizing a hash table when the average number of records per bucket in the hash table exceeds a maximum average number of records per bucket. In one embodiment, the hash table employs a modulo hashing function. In a second embodiment, the number of buckets is grown by a multiple of the previous number of buckets and records are re-hashed using a lazy re-hashing modulo algorithm that re-hashes records in a hash bucket only when those records are searched. In the second embodiment, when a hash table is re-sized, each new bucket is provided with a logical back pointer, or index, to a pre-existing bucket that potentially contains records that belong in the new bucket. When a search is directed at a new bucket, the logical back pointer, or index, directs the search to a pre-existing bucket. When a search of a pre-existing bucket finds a data record that belongs in a new bucket, the record is moved to the new bucket. When there are no more records in a pre-existing bucket that belong in a new bucket, the logical back pointer from the new bucket to the pre-existing bucket is removed. Preferably, the logical back pointer is stored in the bucket where a regular pointer would normally be stored so that no extra space is needed.

24 Claims, 15 Drawing figures

Generate Collection

L2: Entry 5 of 14 File: USPT Apr 6, 1999

US-PAT-NO: 5893120
DOCUMENT-IDENTIFIER: US 5893120 A

TITLE: Methods and apparatus for information storage and retrieval using a hashing technique with external chaining and on-the-fly removal of expired data

DATE-ISSUED: April 6, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nemes; Richard Michael	Brooklyn	NY	11234-2604	N/A

APPL-NO: 8/ 775864
DATE FILED: January 2, 1997

PARENT-CASE:
CROSS-REFERENCE TO RELATED APPLICATIONS Not Applicable STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT Not Applicable REFERENCE TO A MICROFICHE APPENDIX Not Applicable

INT-CL: [6] G06F 17/30
US-CL-ISSUED: 707/206; 707/1, 707/100, 707/101, 707/202
US-CL-CURRENT: 707/206; 707/1, 707/100, 707/101, 707/202
FIELD-OF-SEARCH: 707/1, 707/200-206, 707/2, 707/100-103

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected Search ALL

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	5121495	June 1992	Nemes	707/3
☐	5202981	April 1993	Shackelford	707/1
☐	5287499	February 1994	Nemes	707/206

OTHER PUBLICATIONS

D.E. Knuth, The Art of Computer Programming, vol. 3, Sorting and Searching, Addison-Wesley, Reading, Massachusetts, 1973, pp. 506-549.
R.L. Kruse, Data Structures and Program Design, Second Edition, Prentice-Hall, Englewood Cliffs, New Jersey, 1987, Section 6.5, "Hashing," and Section 6.6, Analysis of Hashing, pp. 198-215.
D. F. Stubbs and N.W. Webre, Data Structure with Abstract Data Types and Pascal, Brooks/Cole Publishing Company, Monterey, California, 1985, Section 7.4, "Hased Implementations," pp. 310-336.

ART-UNIT: 271
PRIMARY-EXAMINER: Black; Thomas G.
ASSISTANT-EXAMINER: Alam; Hosain T.
ABSTRACT:

A method and apparatus for performing storage and retrieval in an information storage system is disclosed that uses the hashing technique with the external chaining method for collision resolution. In order to prevent performance deterioration due to the presence of automatically expiring data items, a garbage collection technique is used that removes all expired records stored in the system in the external chain targeted by a probe into

all expired records st[illegible] in the system in the external c[illegible]in targeted by a probe into the data storage system. More particularly, each insertion, retrieval, or deletion of a record is an occasion to search an entire linked-list chain of records for expired items and then remove them. Because an expired data item will not remain in the system long term if the system is frequently probed, it is useful for large information storage systems that are heavily used, require the fast access provided by hashing, and cannot be taken off-line for removal of expired data.

8 Claims, 7 Drawing figures

Generate Collection

L2: Entry 6 of 14 File: USPT Sep 15, 1998

US-PAT-NO: 5809494
DOCUMENT-IDENTIFIER: US 5809494 A

TITLE: Method for rapidly and efficiently hashing records of large databases

DATE-ISSUED: September 15, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nguyen; John N.	Belmont	MA	N/A	N/A

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Applied Language Technologies, Inc.	Boston	MA	N/A	N/A	02

APPL-NO: 8/ 559532
DATE FILED: November 16, 1995

INT-CL: [6] G06F 17/30
US-CL-ISSUED: 707/1; 364/419.19, 364/421.06, 364/410, 364/427
US-CL-CURRENT: 707/1; 701/15, 704/201, 704/231
FIELD-OF-SEARCH: 395/600, 395/601

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

Search Selected Search ALL

	PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
☐	4215402	July 1980	Mitchell et al.	364/200
☐	4464713	August 1984	Benhase et al.	364/200
☐	4959785	September 1990	Yamamoto et al.	364/419
☐	4961139	October 1990	Hong et al.	364/200
☐	4996663	February 1991	Nemes	364/900
☐	5121495	June 1992	Nemes	395/600
☐	5197002	March 1993	Spencer	364/406
☐	5199073	March 1993	Scott	380/49
☐	5204958	April 1993	Cheng et al.	395/600
☐	5333313	July 1994	Heising	395/600
☐	5359720	October 1994	Tamura et al.	395/400
☐	5511190	April 1996	Sharma et al.	395/600
☐	5542087	July 1996	Neimat et al.	396/600

OTHER PUBLICATIONS

Glenn Fowler, "A Flat file database query language", Usenix, pp. 1-12, Jan. 1994.

C.J.Date "Introduction [redacted] Database Systems" Addison-Wesley [redacted]ublishing Company, 6th ed. pp. 733-738, Aug. 1995.

ART-UNIT: 237
PRIMARY-EXAMINER: Black; Thomas G.
ASSISTANT-EXAMINER: Corrielus; Jean M.
ATTY-AGENT-FIRM: Cesari & McKenna, LLP

ABSTRACT:

A method for rapidly hashing records in a large database stored on a secondary storage device in which a set of memory-blocks are preferably established in main memory for receiving information. Each memory block is associated with a sub-range of hash values that collectively span a range of hash values derived from one or more fields of the database records. The hash values together with other information are distributed among the memory-blocks in accordance with the range of hash values. As each memory block fills, its contents are written to an intermediate file associated with the memory-block in secondary storage. The intermediate files are subsequently retrieved and the hash values stored therein are ordered. The ordered intermediate files are then written to secondary storage as a single hash table spanning the entire database.

9 Claims, 4 Drawing figures

WEST

Generate Collection

Search Results - Record(s) 1 through 14 of 14 returned.

☐ 1. Document ID: US 6115802 A

L2: Entry 1 of 14 File: USPT Sep 5, 2000

US-PAT-NO: 6115802
DOCUMENT-IDENTIFIER: US 6115802 A

TITLE: Efficient hash table for use in multi-threaded environments

DATE-ISSUED: September 5, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Tock; Theron D.	Sunnyvale	CA	N/A	N/A
Wong; Thomas K.	Pleasanton	CA	N/A	N/A

US-CL-CURRENT: 711/216; 707/1, 707/200

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw Desc | Image

☐ 2. Document ID: US 6088685 A

L2: Entry 2 of 14 File: USPT Jul 11, 2000

US-PAT-NO: 6088685
DOCUMENT-IDENTIFIER: US 6088685 A

TITLE: Open end mutual fund securitization process

DATE-ISSUED: July 11, 2000

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kiron; Kenneth	New York	NY	N/A	N/A
Bander; Kevin S.	Bayside	WI	N/A	N/A

US-CL-CURRENT: 705/36; 705/35

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw Desc | Image

☐ 3. Document ID: US 5991859 A

L2: Entry 3 of 14 File: USPT Nov 23, 1999

US-PAT-NO: 5991859
DOCUMENT-IDENTIFIER: US 5991859 A

TITLE: Semiconductor storage device having on-the-fly adaptable storage capacity

DATE-ISSUED: November 23, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nagasawa; Yumiko	Tokyo	N/A	N/A	JPX
Maeda; Shigeyuki	Kawasaki	N/A	N/A	JPX

US-CL-CURRENT: 711/170; 711/154, 711/162, 711/171, 711/172

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWIC | Draw Desc | Image

---

☐ 4. Document ID: US 5960434 A

L2: Entry 4 of 14 File: USPT Sep 28, 1999

US-PAT-NO: 5960434
DOCUMENT-IDENTIFIER: US 5960434 A

TITLE: System method and computer program product for dynamically sizing hash tables

DATE-ISSUED: September 28, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Schimmel; Curt F.	San Ramon	CA	N/A	N/A

US-CL-CURRENT: 707/100; 707/101, 707/102

Full | Title | Citation | Front | Review | Classification | Date | Reference KWIC | Draw Desc | Image

---

☐ 5. Document ID: US 5893120 A

L2: Entry 5 of 14 File: USPT Apr 6, 1999

US-PAT-NO: 5893120
DOCUMENT-IDENTIFIER: US 5893120 A

TITLE: Methods and apparatus for information storage and retrieval using a hashing technique with external chaining and on-the-fly removal of expired data

DATE-ISSUED: April 6, 1999

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nemes; Richard Michael	Brooklyn	NY	11234-2604	N/A

US-CL-CURRENT: 707/206; 707/1, 707/100, 707/101, 707/202

Full | Title | Citation | Front | Review | Classification | Date | Reference KWIC | Draw Desc | Image

---

☐ 6. Document ID: US 5809494 A

L2: Entry 6 of 14 File: USPT Sep 15, 1998

US-PAT-NO: 5809494
DOCUMENT-IDENTIFIER: US 5809494 A

TITLE: Method for rapidly and efficiently hashing records of large databases

DATE-ISSUED: September 15, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Nguyen; John N.	Belmont	MA	N/A	N/A

US-CL-CURRENT: 707/1; 701/15, 704/201, 704/231

Full | Title | Citation | Front | Review | Classification | Date | Reference KWIC | Draw Desc | Image

☐ 7. Document ID: US 5806048 A

L2: Entry 7 of 14 File: USPT Sep 8, 1998

US-PAT-NO: 5806048
DOCUMENT-IDENTIFIER: US 5806048 A

TITLE: Open end mutual fund securitization process

DATE-ISSUED: September 8, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Kiron; Kenneth	NY	NY	N/A	N/A
Bander; Kevin S.	Chicago	IL	N/A	N/A

US-CL-CURRENT: 705/36; 705/35

Full | Title | Citation | Front | Review | Classification | Date | Reference KWIC | Draw Desc | Image

☐ 8. Document ID: US 5732214 A

L2: Entry 8 of 14 File: USPT Mar 24, 1998

US-PAT-NO: 5732214
DOCUMENT-IDENTIFIER: US 5732214 A

TITLE: System for universal archival service where transfer is initiated by user or service and storing information at multiple locations for user selected degree of confidence

DATE-ISSUED: March 24, 1998

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Subrahmanyam; Pasupathi Ananta	Freehold	NJ	N/A	N/A

US-CL-CURRENT: 709/227; 709/217

Full | Title | Citation | Front | Review | Classification | Date | Reference KWIC | Draw Desc | Image

☐ 9. Document ID: US 5649109 A

L2: Entry 9 of 14 File: USPT Jul 15, 1997

US-PAT-NO: 5649109
DOCUMENT-IDENTIFIER: US 5649109 A

TITLE: Apparatus and method for maintaining forwarding information in a bridge or router using multiple free queues having associated free space sizes

DATE-ISSUED: July 15, 1997

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Griesmer; Martin Edward	Arlington	MA	N/A	N/A
Krishnakumar; Parayath Gopal	West Newton	MA	N/A	N/A
Benson; David	Acton	MA	N/A	N/A

US-CL-CURRENT: 709/242; 370/241, 370/401

Full | Title | Citation | Front | Review | Classification | Date | Reference | KWIC | Draw Desc | Image

---

☐ 10. Document ID: US 5555405 A

L2: Entry 10 of 14 File: USPT Sep 10, 1996

US-PAT-NO: 5555405
DOCUMENT-IDENTIFIER: US 5555405 A

TITLE: Method and apparatus for free space management in a forwarding database having forwarding entry sets and multiple free space segment queues

DATE-ISSUED: September 10, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Griesmer; Martin E.	Arlington	MA	N/A	N/A
Benson; David	Acton	MA	N/A	N/A

US-CL-CURRENT: 707/205; 370/401, 370/411, 370/412

Full | Title | Citation | Front | Review | Classification | Date | Reference | KWIC | Draw Desc | Image

---

☐ 11. Document ID: US 5542089 A

L2: Entry 11 of 14 File: USPT Jul 30, 1996

US-PAT-NO: 5542089
DOCUMENT-IDENTIFIER: US 5542089 A

TITLE: Method and apparatus for estimating the number of occurrences of frequent values in a data set

DATE-ISSUED: July 30, 1996

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Lindsay; Bruce G.	San Jose	CA	N/A	N/A
Shekita; Eugene J.	San Jose	CA	N/A	N/A

US-CL-CURRENT: 707/2

Full | Title | Citation | Front | Review | Classification | Date | Reference KWIC | Draw Desc | Image

---

☐ 12. Document ID: US 5423038 A

L2: Entry 12 of 14 File: USPT Jun 6, 1995

US-PAT-NO: 5423038
DOCUMENT-IDENTIFIER: US 5423038 A

TITLE: Specialized data management method

DATE-ISSUED: June 6, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Davis; Marilyn	Palo Alto	CA	94306	N/A

US-CL-CURRENT: 705/12; 345/751, 709/313

Full | Title | Citation | Front | Review | Classification | Date | Reference KWIC | Draw Desc | Image

---

☐ 13. Document ID: US 5414704 A

L2: Entry 13 of 14 File: USPT May 9, 1995

US-PAT-NO: 5414704
DOCUMENT-IDENTIFIER: US 5414704 A

TITLE: Address lookup in packet data communications link, using hashing and content-addressable memory

DATE-ISSUED: May 9, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Spinney; Barry A.	Wayland	MA	N/A	N/A

US-CL-CURRENT: 370/389; 707/1, 711/108, 711/216

Full | Title | Citation | Front | Review | Classification | Date | Reference KWIC | Draw Desc | Image

---

☐ 14. Document ID: US 5396624 A

L2: Entry 14 of 14 File: USPT Mar 7, 1995

US-PAT-NO: 5396624
DOCUMENT-IDENTIFIER: US 5396624 A

TITLE: Account file for off-line transaction authorization

DATE-ISSUED: March 7, 1995

INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Campbell, Jr.; Carl M.	Newtown Square	PA	N/A	N/A

US-CL-CURRENT: 705/44; 235/380, 707/1, 707/9

Full | Title | Citation | Front | Review | Classification | Date | Reference | KWIC | Draw Desc | Image

Generate Collection

Terms	Documents
5121495.uref.	14

Display 40 Documents, starting with Document: 14

Display Format: CIT Change Format